435

the morning, and clicking through here, we see that the puffs don't quite make it or just barely make it to the Montana border, but now the winds, as we saw in the previous simulation, are reversing direction as that circulation moves through. And the puffs are now going to retreat, the old puffs are going to retreat. The new puffs are hanging back. And so we see that in this stimulation the plume got to the Montana border and then reversed direction.

Now, I want to show you the same period with the MM5 model simulation. Almost the same level, but you notice the winds are much stronger. We have here surface and upper air stations, similar symbols. The strength of the wind will be an important component to how this puff evolves. Same source, same time, puff goes well into Montana. Clearly -- and I think this -- and then we're going to see the winds recirculate. The dilution wind speed at plume level is higher, much higher for this event, for this model than the other model. I think it's a key to noting -- a key to why this model is predicting lower. I think the winds from the previous modeling that was done may be underestimated at upper levels. Therefore, the dilution wind speeds may be underestimated and so we

436

decided now to -- well, let's run some simulations for compliance assessments just to see what would happen.

We have four results to show. Just to take into account everyone's point of view here, North Dakota baseline and North Dakota current sources using the average emissions -- by the way, I want to mention that for the CALMET processing for the MM5 we used by lack of default, for the most part, except we used the similarity dispersion, so we didn't have to worry about these biases of terrain influences with height because the data were so good coming in we didn't have to fiddle with that. Just wanted to leave that thought with you, that we got away from all of the nonIWAQM departures that have been noted by Notar, and so on, with this new database.

Now, returning to this presentation of what were the source combinations and post processing combinations that we used. North Dakota baseline and concurrent sources, no variant sources, as mentioned before. And then we took the higher of the -- we took basically the high 90 percent short-term emissions to see what that would do. We processed it two ways. One way with the MAAL

437

approach, and one way with the EPA paired in time and space approach. And I think I just got into that thought there. The paired in time and unpaired in time approach, where the unpaired in time uses the MAAL. MAAL is set by the baseline, running the baseline emissions, noting the second highest concentration over all receptors. We did not use spatial average. We just took the second highest overall receptors, as Kirk was noting, added the increment and that established the MAAL. We then ran the current and compared the current second highest to the MAAL.

The paired in time used the traditional EPA approach of adding increment expanders and consumers paired in time and space, comparing the results directly to the increment limits. You may not all be able to see these numbers. I apologize. But let me just point out that this is the results using the MM5 data for the year 2000 with the North Dakota current emission rates using annual averages. The MAALs -- we don't have any exceedences of any MAALs and, in fact, the highest percentages are only 75 percent; whereas with North Dakota's run with the same emissions, I think they were more than 98 percent. So this model predicts lower impacts than

438

the North Dakota run using the same emissions, basically, and the same approach. But by a substantial margin. The 3-hour percentages of the MAAL are generally up in the 60s, for the most part, and the 24-hour predictions, the peak is 75 percent.

Using the EPA approach, in terms of post processing using annual current emissions, we note that there are no exceedences of any increment at all. The 3-hour highest second highest, when you compare it in time and space is no more than 11.29, and the second highest 24-hour is only 2.76. Quite a change, obviously, from the EPA results. Now, when we go to the higher emissions on the current, going to the 90 percent of max emissions, using MAAL approach we are still okay. Now we're up to a maximum of 88 percent of the MAAL on the 24-hour prediction for Teddy Roosevelt North Unit, but no exceedences of the MAAL in any case and certainly no violations there.

And, finally, the EPA approach for this would show the highest second highest 24-hour increment to be 4.2. There is one exceedence of just 5.02, but the second highest was 4.20. That's the closest we come to any brush with the available increment.

439

So in conclusion, finally, the last line, I recommend based on the superiority of the meteorological data from a meteorologist's point of view, that this meteorological data be used and considered for this application. Remember that the Federal Land Managers allow one year to be used for this type of application. The evaluation results show better performance. The lower concentrations appear to result from higher dilution wind speeds. The model evaluation still shows the model is protective of air quality. The initial modeling results show that the North Dakota SIP is likely to be protective of the PSD Class I increments after all. That's it. I'd be happy to have any questions.

MR. SCHWINDT: Could you clarify for me again the inputs that you used in making that final model run?

MR. PAINE: This last slide? Okay. We took -- it's a lot of numbers in my head here. We took the North Dakota baseline and then we computed the current emissions that would recreate what EPA assumed for their 90th percent of max and, therefore, used EPA's approach to the current emission rates. We didn't include the variant

440

sources, as we've discussed before, but otherwise we used EPA's emissions in their entirety. That's the only difference. And we got a highest second highest of 4.2 and that was the closest we got to any increment.

MR. SCHWINDT: And what did you mean by paired in time and space?

MR. PAINE: The way EPA does their post processing is that they take the baseline and the current emissions for every receptor and every hour and they subtract them and they take that difference. The way they would want you to do it -- basically, we used their approach pretty much, just arguing from the point of view, well, gee, if we use their approach, use their -- even their peak estimates of emissions, what would we get? And so just for -- just to see what would happen. Even though we don't agree with it, we just wanted to see what would happen.

MR. SCHWINDT: And the MM5 data is available for the year 2000, or it can be custom made to whichever year you want to use?

MR. PAINE: Well, the RUC data that's the essential component only became available in 2000, so it's not available before 2000. That

441

basically -- you know, Basin Electric would be responsible for any distribution of that data set, but it's available for the year 2000.

MR. SCHWINDT: Has the RUC, this process been used by anybody, and has EPA bought off on this type of an approach using that meteorological data?

MR. PAINE: I'm not -- I know that there have been studies that use the SSESCO data. I know for some health-risk assessment studies in the Midwest there's -- you might have heard about those types of studies. So there are papers written that have used those data. The EPA has actually recommended the use of those data in the aftermath of the public hearing on the proposed guideline and that's on the EPA Website, the fact that they would recommend this use of data. And, you know, I could -- we could provide in writing those citations.

MR. SCHWINDT: That would be good. The other thing is, you had mentioned that you have used different values for background concentrations and you had looked at some of the monitoring information for the Teddy Roosevelt South Unit for background information or background values. That was based strictly on the monitoring information from that

442

location?

MR. PAINE: Right. We wanted to add the required component of unmodeled background that is required by EPA of any total concentration estimate. To assess that we looked at days when the winds were not blowing from any major source to see what the likely regional background was in the absence of any major source. Anything that was -- in the absence of anything that was modeled, we wanted to see what the monitor was seeing and that would be representative of unmodeled background.

MR. SCHWINDT: And that was not included in either the EPA's or the Department's model runs?

MR. PAINE: To the extent that I could discern, unless anyone can correct me, I do not believe that was included.

MR. SCHWINDT: But you have used those values or similar values in similar applications in other areas of the country?

MR. PAINE: For any assessment of compliance with standards, EPA requires in their guideline and air quality models that you include this component, as I noted in that citation. You must include that component because you have to have background. They always remind you to add

443

background and then they forgot to add background.
MR. SCHWINDT: Okay. Thank you. Are there any other questions?
MR. WITHAM: Yeah. This is Lyle Witham, Attorney General's Office. Did you do a modeling run using allowables on this data set?
MR. PAINE: Well, we've had very little time, as you can imagine, to do much of anything. We've pretty much done what you see. Basically, using either the current emissions used by the North Dakota Department of Health, which are the annual averages for the current, or the EPA version of that, but that's all we've had time to do.
MR. WITHAM: So just to clarify, you ran the average rate of tons per year number that the rule says that we're supposed to use and you ran the 90th percentile 24-hour emissions rate that EPA used --
MR. PAINE: Yes.
MR. WITHAM: -- for these numbers?
MR. PAINE: Yes.
MR. WITHAM: You did not run allowable?
MR. PAINE: No, I don't even know what those are. No, we have not.
MR. WITHAM: I want to follow up on a

444

couple of the hearing officer's questions, too, because the numbers of concern are the 24-hour numbers at the park. Now, I want to just make sure I understood what you said. You said you compared basically the monitoring data to the model predictions?
MR. PAINE: For the year 2000, for this new model, that's correct.
MR. WITHAM: Well, let me focus my question so -- you covered a lot of areas and it's late in the day and I'll try and focus the question so you understand it. Basically, you said that without adding the background data, which you pointed out Table 9.2 requires from Appendix W, but without using that background data, even then at the highest concentrations, which is the focus of the hearing and of PSD in some context, even then at the highest grid, the model is overpredicting the actual monitoring concentrations by a factor of 1.5?
MR. PAINE: In some cases it was. Those figures were included in the North Dakota April report, and I have reproduced them here.
MR. WITHAM: And then basically when you add the background data, your testimony is that it's overpredicting by more than a factor of 2, correct?

445

MR. PAINE: In one case the 24-hour Teddy Roosevelt point, some of them were slightly more than a factor of 2 overpredicted toward the high end.
MR. WITHAM: And to be used it's supposed to be within that factor of 2?
MR. PAINE: Well, a factor of 2 is a rule of thumb and it's -- if you're 2.02, you know, if you're slightly more than that, it doesn't throw off the model, but as you approach that factor of 2, you start to become concerned that, well, I have a systemic overprediction bias, shouldn't I try to do better. That's basically what led to this other modeling exercise, plus --
MR. WITHAM: Now, just for clarification. I have several clarification questions. A factor of 2 means it overpredicts by 200 percent; is that --
MR. PAINE: Well, overpredicts by 100 percent. The prediction is twice the observation.
MR. WITHAM: Okay. I did misunderstand that. So a factor of 1 would be an over --
MR. PAINE: A factor of 1, we're taking the ratio of the prediction to the observation and if it's 1, that means it's a perfect model. If it's 2, that means the prediction is twice the observed.

446

MR. WITHAM: All right. The acronym IWAQM has been thrown around a lot here. Would you explain what IWAQM stands for and what IWAQM is?
MR. PAINE: Sure. The Interagency Work Group on Air Quality Models was formed in 1991 to try to address the fact that there was no approved long-range transport model. Therefore, the Federal Land Managers had nobody running anything to assess impacts at their Class I areas because there was nothing to run. So they decided to get some consistency between the EPA and their various agencies to formulate some techniques to address this void in the modeling procedures. They went through two phases; one, to adopt something that was immediately available, which was Mesopuff, and then to improve upon that to go to Calpuff. Finally, EPA with -- in consultation with the Federal Land Managers through the IWAQM joint committee has proposed Calpuff as a -- finally, as the first proposed guideline air quality model for long-range transport.
MR. WITHAM: And you're saying IWAQM is a committee?
MR. PAINE: A committee, yes.
MR. WITHAM: Who's on that committee?

447

MR. PAINE: Well, I have -- I don't know if it's standing anymore. If I'm allowed to, I have a report in my briefcase. In December of '98 the phase 2 report appeared on the EPA's spring Website. Let's see. There's several acknowledgments. Let's see if there's a list -- well, let me just read the acknowledgments. Special efforts by Mark Scruggs, John Notar, and John Vimont of the National Park Service. Alan Cimorelli of the U.S. EPA. John Irwin of NOAA, National Oceanic and Atmospheric Administration. Richard Fisher, Bob Bachman, Bud Rolofson of the U.S. Fish and Wildlife Services. Pat Hanrahan of the State of Oregon. Ken McVee of Virginia State Agency. Those are probably major contributors. There's other members. I don't know if they list all the members, but those are contributors, so several people in the Denver office of the National Park Service and Fish and Wildlife Service.

MR. WITHAM: In summary, they've got members from state representatives, Fish and Wildlife representatives --

MR. PAINE: Forest Service, National Park Service, and EPA.

MR. WITHAM: -- National Park Service, EPA?

448

MR. PAINE: Yes.

MR. WITHAM: I've got a few questions on Table 9.2. Do you have that handy?

MR. PAINE: I think it was Section 9.2, and I don't have it handy, but maybe we could just share that. Okay. Do you have a question?

MR. WITHAM: Yeah, several. Go to Section 9.2. There's also a Table 9.2 in there.

MR. PAINE: Mm-hmm.

MR. WITHAM: Table 9.2 basically shows the different modeling inputs you're supposed to use.

MR. PAINE: Correct.

MR. WITHAM: And it's got three different kinds of things you're supposed to put in there, and basically one for background, one for nearby sources, and one for the proposed new NSR source. Would you just basically explain what that is supposed to be for and how it's supposed to be used?

MR. PAINE: Sure. This, from my understanding, is for the national ambient air quality standard compliance demonstration, and it tells what kind of emission rates you're supposed to use for the sources. If you have a proposed new source, you should use the maximum emission rate. If you have background sources, you're supposed to

449

use actual emission rates.

MR. WITHAM: Okay. Now, for nearby sources it talks in terms of using what for emission rates?

MR. PAINE: Well, let's see. The emission -- let's see. It's the emission limit -- for short-term maximum allowable emission limit times the operating level of -- actual operating level of one million Btu's per hour. So, say, you had so many pounds per million Btu that was the maximum measurement, you would take that and you would take the actual million Btu's per hour and -- or I guess it says actual or design capacity, whichever is greater, from nearby background sources. But this, again, is for a national ambient air quality standard compliance, not an increment compliance. So that's an essential difference.

MR. WITHAM: That was my point. That table was not intended to be used for an increment compliance determination?

MR. PAINE: Right. There is a 1990 draft NSR, they call it the puzzle book, that gives some indication of what to use for increment compliance.

MR. WITHAM: Okay. And that draft puzzle book has never been adopted as a rule by EPA; is that correct?

450

MR. PAINE: That is my understanding.

MR. WITHAM: I guess that answers my basic questions on that. And those are probably all the more technical questions I have, but it's late in the day, but I would like to have you kind of clarify a few things, just some basic concepts that in terms of -- so to understand this, some of this information that you've presented here today which is quite complex and hard to deal with unless you have -- now, what you're doing is modeling what you call a plume, right?

MR. PAINE: Yes.

MR. WITHAM: Now, a plume comes out, it's actually something that comes out of a stack and you assume it's kind of clumped together, right?

MR. PAINE: Right. It's a continuous emission so it's not disconnected in reality.

MR. WITHAM: Okay. And that plume, in this particular case we're talking about sulfur dioxide. What is sulfur dioxide when it comes out of the stack? Is it a gas or a particulate?

MR. PAINE: It would be a gas.

MR. WITHAM: Okay. And then what happens after it comes out of the stack? It's at a very high temperature, so what happens then when it comes

451

out of the stack?
MR. PAINE: Well, the plume would rise and it would entrain ambient air, you know, clean air, and become more dilute and bend over with the wind.
MR. WITHAM: And how much does it rise? Does it depend on temperatures outside and things like that?
MR. PAINE: Sure. It depends on the temperature of the stack gas, the temperature outside, so the temperature difference, the volume flow rate and other similar considerations. If there are any buildings nearby, that would affect any turbulence, but the basic things would be the flow rate and the temperature excess.
MR. WITHAM: Okay. And then does that plume tend to stay clumped together more when the winds are low or when they're high?
MR. PAINE: Well, when the winds are high, there's not a lot of turbulent looping eddies that would tend to mix the plume up and down rapidly like you'd have in very sunny, light wind conditions. Plumes tend to hang together in high winds.
MR. WITHAM: Okay. And in low winds what happens?
MR. PAINE: In low winds you have more of a

452

change of vertical motions to cause the plume to go up and down and become what they call the looping plume, that it goes up and it goes down, and -- as it comes out the stack at various time intervals. So it isn't straight. It has a lot of vertical motions.
MR. WITHAM: And then would you explain the effect of daylight and night?
MR. PAINE: That would affect the turbulence in the atmosphere that would affect how the plume is mixed. During the day the turbulence is much higher so the plume would be expected to mix more in the vertical during the day and during the night it would not be expected to mix nearly as much.
MR. WITHAM: Okay. And all of that stuff is taken into consideration in the modeling --
MR. PAINE: Yes, it is.
MR. WITHAM: -- and all that data put in? Will you explain the butterfly effect?
MR. PAINE: Sure. Basically, there are small motions that are not observed, but will eventually affect -- if you go forward in time enough, affect the motion of something far away because it just carries -- it gets -- I guess it

453

trans -- deports itself around the world basically. Unnoticed motions will eventually contaminate any weather forecast. That's been realized for several years. The chaos theory, you might have heard of the chaos theory, and that was an interesting point where a professor at the University of MIT decided to truncate a number in his modeling and found out the result was completely different than if he didn't truncate it. That was because a slight deviation in the trajectory made the result go a totally different way. And that can happen in air quality where if you nudge a plume coming off the stack a little bit going up, it might be caught in a different wind direction, and if you don't know about an effect 50 kilometers away, that effect might eventually move into your area and affect the wind, but you didn't account for it, so that's sort of the butterfly effect.
MR. WITHAM: And basically it's the butterfly effect that makes the models not very good at predicting or matching time to time as you showed in some of your illustrations?
MR. PAINE: Well, that plus the fact that near the stack there are unmeasurable small vertical motions that will move the plume from side to side

454

and forever affect their trajectories just enough that they will miss a particular point in space that hit, you know, a little bit farther away, but since they're narrow enough, that will significantly affect the accuracy in hitting a small target. Now, hitting a small target is very hard to predict. A slight deviation will make the model miss it entirely. And that's the problem. It just takes a small, unmeasurable deflection as the plume is coming out of the stack to forever alter its trajectory and, therefore, I think it's just impossible. People have just given up. It's impossible to hit a target in a particular time because of these unmeasurable small deflections.
MR. WITHAM: And, basically, if I can summarize what you're saying in your suggested modeling, is that you're saying the Department should adopt the approach that you're suggesting because it's more accurate -- it's closer to actual monitored than -- or the actual conditions then what the Department did or what EPA did; is that right?
MR. PAINE: In terms of the meteorological model, I believe it's superior because it has much more observations in time and space than have ever been available before. EPA also recommended that

BEFORE THE NORTH DAKOTA DEPARTMENT OF HEALTH

PROPOSED DETERMINATION OF THE
ADEQUACY OF THE NORTH DAKOTA
STATE IMPLEMENTATION PLAN TO PREVENT
SIGNIFICANT DETERIORATION

TRANSCRIPT OF

HEARING

VOLUME III

PAGES 457-654

Taken At
Brynhild Haugland Room
State Capitol
Bismarck, North Dakota
May 6, 7 & 8, 2002

BEFORE MR. DOUG BAHR AND MR. FRANCIS SCHWINDT
-- CO-HEARING OFFICERS --

EMINETH & ASSOCIATES
Court Reporters
BISMARCK, NORTH DAKOTA
(701) 255-3513

BEFORE THE NORTH DAKOTA DEPARTMENT OF HEALTH

PROPOSED DETERMINATION OF THE ADEQUACY OF THE NORTH DAKOTA STATE IMPLEMENTATION PLAN TO PREVENT SIGNIFICANT DETERIORATION

TRANSCRIPT OF

HEARING

VOLUME III

PAGES 457-654

Taken At
Brynhild Haugland Room
State Capitol
Bismarck, North Dakota
May 8, 2002

BEFORE MR. DOUG BAHR AND MR. FRANCIS SCHWINDT
-- CO-HEARING OFFICERS --

CONTENTS

(The proceedings continued, commencing at 9:02 a.m., Wednesday, May 8, 2002, as follows:)

MR. SCHWINDT: Good morning. There's a couple housekeeping issues that we need to perhaps discuss just a bit. One is that the schedule that we were operating on had Great River Energy scheduled for their testimony this afternoon. They do have a couple people that need to travel, so after Basin Electric finishes their presentation this morning, we will then go to Great River. Then the remaining people that I had scheduled should follow basically the same order that I had talked to you about before, so it would be just probably this afternoon.

Again, if there are other people that are not scheduled to present some testimony this morning and are interested in providing some testimony, please let me know so that we can work that into the schedule. It does look like if the presentations don't go longer than what I had been -- that had been indicated to me, we should be able to finish up today, but I guess we will wait and see how the day unfolds.

Some people have talked to me about a possible extension of the comment period after

this. I guess we're certainly willing to consider that. There's some concern about the availability of the hearing transcript. I did talk to the court reporter. They are still planning on having the transcript available within five days of the close of the hearing. Is that not correct? And you can contact her directly for copies of the transcript.

So I guess as far as extending the hearing comment period, like I said, we certainly are interested in providing ample opportunity to provide comments on this. I know EPA had indicated the other day that some additional time would be useful for them, so I guess we're willing to do that. Any thoughts on how long a time that you would be looking at beyond the end of the hearing here? We initially indicated that comments would be requested before May 15th, so nine days after that, on the 24th, that would be the following week on a Friday. That weekend is Memorial weekend. I don't know whether you want to work through that weekend or how you want to do that, so give it some thought and we can make a decision at the close of the hearing on how long we're going to extend the comment period. If you have some thoughts, please let me know what those might be.

Page 461

Anything else, Doug, that we need to talk about?

Okay. With that we will turn it back over to Mr. Connery of Basin Electric.

MR. CONNERY: Thank you, Mr. Hearing Officer. Basin Electric has one more witness and then a few closing remarks, and the next witness is Mr. Curt Melland. Many of you know Curt is the plant manager of Leland Olds plant and has been there since 1976, just happens to be the period when you started looking at the emissions of this plant. Curt tells me he wasn't plant manager in 1976, when he got out of North Dakota State with a bachelor of engineering and a master's of engineering, but he knows this plant from the ground up, and he is going to address the issue you asked for comment on of whether or not the emissions which you have put into your modeling are representative of normal operations of the plant.

I would simply call to your attention, as I mentioned at the outset, that in previous -- for the permitting of this plant and for many previous exercises, the allowable emissions have been included. EPA, if you also noticed, said that Milton R. Young Unit 2, because it had only been

Page 462

operated for nine months, that its allowable emissions should go into the modeling. It did that because it wasn't up -- it wasn't operating normally. And the third test says that when you're not operating normally, you use potential, which when you have a permit, is more limited.

So the basis on which you include this can either be the one that you've proposed, which is actual emissions and operating history, and Curt is going to testify to that or it can be allowable emissions, which is what we've urged as a first preference in what we think is fair for the plant.

And with that, I'll turn it over to Curt. Thanks.

MR. MELLAND: Good morning. I thank you for this opportunity to provide this testimony. My testimony will be covering two points. The first point will be the selection of the two most representative years of operation in the baseline period of 1975 and 1980, and the second point will be explaining an apples to apples comparison of the maximum emission rates of the baseline years to the current years.

Before I start, I should give you a copy of the slides that I'll be using. Depicted here is

Page 463

the Leland Olds Station. It's located along the Missouri River not too far from Stanton, North Dakota, in Mercer County.

The station was developed as the part of Basin Electric was growing to supply electric generation power for Basin Electric and its member cooperatives. Leland Olds is designated or designed as a base load plant, and it was expected as a base load plant to operate a full load around the clock.

Leland Olds Unit 1 was completed in 1965, has a rated generating capacity of 216 megawatts. In 1971 an electrostatic precipitator was installed to control particulate emissions. The electrostatic precipitator has a collection efficiency of 99-plus percent.

Leland Olds Unit 2 was completed in 1975. It has a rated generating capacity of 440 megawatts. It, too, has an electrostatic precipitator to control particulate emissions which also has a collection efficiency of about 99.5 percent. Both Leland Olds Unit 1 and Leland Olds Unit 2 have been subject to the emission limit of three pounds SO2 per million BTUs since the baseline date.

Page 464

Now, the determination of which two years is the baseline period depends on which two years are representative of normal source operation. The next two slides I'll show you quote the regulations which govern the selection of the more representative years for normal operation.

It says, The actual emissions is the rate of emissions during a two-year period which precedes the particular date and which is representative of normal operation. The Department may allow the use of a different time period upon a determination that it is more representative of normal source operation. In addition, if a source can demonstrate that its operation after the baseline date is more representative of normal source operation than its operation preceding the baseline date, the definition of actual emissions allows the reviewing authority to use the more representative period to calculate the source's actual emissions contribution to the baseline concentration. EPA thus believes that sufficient flexibility exists within the definition of actual emissions to allow any reasonably anticipated increases or decreases genuinely reflecting normal source operation to be included in the baseline

Page 465

concentration.
This last part is important. I'll read it again. EPA thus believes that sufficient flexibility exists within the definition of actual emissions to allow any reasonably anticipated increases or decreases genuinely reflecting normal source operation to be included in the baseline concentration.
Now, the Department reviewed 1975 and 2000 -- to 2000 operating data. They looked at heat input values, hourly and total, to determine the representative normal source operation.
Here you can see the data that they utilized. This chart is for the heat input per operating hour. These are the facilities that they looked at, and you'll note that here's Unit 1 for Leland Olds and here's Unit 2. Similarly, they took a look also or utilized the data for total heat input and, again, here are the same facilities, and, again, here is LOS Unit 2 and Unit 1.
Now, for each source the Department then used as the baseline period the two sequential years between 1975 and 1980 which had the highest heat input per operating hour. Basin Electric

Page 466

believes that it's more appropriate to use total heat input, instead of hourly heat input, to determine the normal source operation.
Typically Leland Olds -- or power plants such as Leland Olds are removed periodically to perform significant maintenance and repairs, and during this period of time overhauls of the boiler, turbine and other equipment are done. These overhaul periods are called major outages, and they typically last from four to eight weeks. Now, any calendar year in which a major outage occurs, the operating hours are significantly reduced. In the period between 1975 and 1980, Leland Olds' major outages were scheduled every 18 months, so every 18 months you had a major outage.
Now, in addition to the major outages, if you would have an equipment failure, you could end up with extensive out-of-service hours, as well. Now, using hourly inputs, that ignores these out-of-service periods -- yeah, the hourly heat inputs ignores the out-of-service periods and then essentially ignores an essential factor in judging whether the years are most representative of normal source operation. However, if you use total heat input, that takes into account those hours of

Page 467

operation and the out-of-service periods, and, therefore, is a better measure of a normal operation period.
Leland Olds Unit 1 had major outages scheduled in 1976, 1977, 1979 and 1980. Now, this graph shows the total heat input the State used for Leland Olds Unit 1. If you look at the total heat input, you can see the effect of the outages in '76 and '77. Therefore, if we have to use two sequential years, we choose that the most representative of normal operation are the years 1977 and 1978. We believe this because it includes 1978 in which there were no major outages and that the heat input for these years was anticipated as of the baseline date and that these years reflect normal operation.
In 1976 and 1977 Unit 2 was in a startup/ breakin period and experienced equipment failures and other problems.
This graph is the State graph for Leland Olds for total heat input, and you'll notice Unit 2 came on line in December of 1975. You can see the effect that that short-time operation had to our total heat input. Also, you can see in the breakin period when we experienced numerous difficulties

Page 468

how that affected our total heat input. And in the following year you'll also notice that we had outages and major equipment failure, and you can see also there how that affected our total heat input. For both of those years we had over 2,000 hours of outage hours, so you can see it had a significant impact on our operating hours.
From this graph one can see that the more normal operation period would be then from the years 1978 and 1979. We believe this because it includes 1979, the only year between 1975 and 1980 not involving a startup or breakin period or a major outage, and it includes heat inputs for these years which was anticipated as of the baseline date, and that these years more reflect normal operations of Unit 2.
Now, 1976 and 1977 does not represent normal operation of Unit 1 or Unit 2 for these reasons. Unit 1, we had major outages in the spring of 1976 and in the fall of 1977, 18 months apart. To be representative of a two-year period, it needs to include at least one year without a major outage. Otherwise, if you choose two years which incorporate a major outage, that would be representative of having a major outage in every

Page 469

year, which is definitely not the case.
Now, Unit 2 is a cyclone boiler, and it was one of the first of its size to be installed in the United States to burn lignite.
Now, cyclone boilers are significantly different than PC-fired boilers. The fuel, for instance, instead of being crushed to face powder consistency, as in a PC burner, is crushed to pea size. A PC burner sprays this fine powder out into the boiler and ignites it.
In a cyclone boiler, this pea-sized fuel goes into a round, horizontal burner and there burning takes place with a what you might call horizontal tornado. For this thing to work properly, the temperatures inside the cyclone must become very high such that the majority of the ash is melted and flows out of the cyclone burner, then flows down into the bottom of the boiler and out of the bottom of the boiler. To do this the temperatures have to be very high for this to work properly in the cyclone burner.
Now, lignite is a fuel that has high moisture and high ash, low BTU content. It took a significant period of time for Basin Electric to learn how to make lignite work, burn hot enough in

Page 470

a cyclone burner for it to maintain these high temperatures.
As a result, during 1976 and 1977, there were frequent slagging and fouling periods of the Unit 2 boiler and there were many other equipment problems, and these resulted in numerous out-of-service periods, as I've shown.
Now, the following are only the most significant of those out-of-service periods.
In February 1976, the boiler slag taps in the bottom of the boiler froze up, the cyclone continued -- cyclone burners continued feeding this liquefied molten ash into the bottom of the boiler, which then solidified into a rock-hard mass. It took us seven days jackhammering in the bottom of that boiler to clean -- to clear this accumulation.
In 1976, the boiler was taken out of service for manufacturer modifications of our boiler and turbine.
Then in April of '76, the turbine was again taken out of service for three days for additional turbine modification.
In May 1976, the unit was taken out of service this time because of the generator ground

Page 471

fault.
In July of 1976, we were out four days in order to repair the precipitator.
In September 1976, you can see we're still struggling learning how to burn that lignite, we were out of service again for two days where, once again, the slag -- the boiler slag taps froze up and we filled the bottom of the boiler with solidified rock-like molten ash.
Then in October 1976, we were out of service five days when our 8,000-horsepower IB fan motor failed.
In November 1976, we were out of service for seven days when not only the bottom of the boiler plugged up with ash, but also the convection pass. It took us seven days to clear that ash out of it once again.
Then in April 1977, we had a scheduled major outage. This lasted 37 days.
And then, once again, in November of 1977, we were out of service for 29 days when we experienced a turbine blade failure.
From all this you can see that 1976 and 1977 certainly was atypical and does not represent normal operation. In fact, Unit 2 was not in

Page 472

normal operation until well past the minor source baseline date, December 17, 1977.
The next part of my presentation will discuss method to compare maximum -- an apples to apples comparison, I might say, compare maximum 3-hour and 24-hour emission rates for representative baseline years to the maximum 3-hour and 24-hour emission rates using the CEM data.
The Leland Olds Station in the baseline years between 1975 and 1980 received its coal from the Glenharold Mine. Now, for every day that we received a delivery from the Glenharold Mine, an ASME coal sample was taken. Now, this coal sample was analyzed for sulfur only two to four times a month. When we did our calculations, we chose only those days in which the sulfur was analyzed to help us be more confident what the sulfur content actually was in the coal being burned.
Now, to calculate emission rates, one of the first things we need to do is calculate our coal burn rate, and to do that we utilize our average monthly heat rate, which is a relationship that gives our -- defines the amount of BTUs it takes in a facility to generate one Kw of power. Now, using that relationship -- we obtained that

Page 473

relationship by using our -- excuse me. We obtained that relationship by using our data for our total monthly coal burn, the average monthly coal heat content in BTUs per pound, and divided it by our total monthly generation. It's an efficiency factor. It shows you how efficient that particular unit is operating. Then using that efficiency factor, we went back into the daily generation logs and we scanned the generation logs until we could find the three consecutive hours that gave us the maximum generation. Then using that total we multiplied that times the heat rate, divided it by the actual heat content of the coal for that day to get the total amount of tons burned in that three-hour period of time. To change that into a rate of tons per hour, we then divided it by three.

Now, for the 24-hour we did the same thing, only instead of the maximum generation for three hours, we just took the daily total megawatts generated for that day and used the same relationship. That gave us the total amount of tons burned in that day, and then to convert it to a tons by hour, we divided it by 24.

Then to calculate a 3-hour maximum

Page 474

emission rate, we used that coal burn rate and we multiplied it times the relationship that Mr. Hammer developed to give us an apples to apples comparison with CEM data. And for Unit 2 it is 40 times the percent of sulfur in that daily sample, and for Unit 1 it's the coal burn rate times 36 times the percent of sulfur in that daily sample.

Now, when you make these calculations, then you can take a look with an apples and apples comparison of emission rates during the first baseline period of 1975 through 1980 to the emission rates of current years 2000-2001. And this bar chart shows that comparison. This is for Unit -- Leland Olds Unit 1. It is the maximum 3-hour emission rate comparison. This bar shows the maximum 3-hour emission rate for the year 1977. This bar shows the maximum 3-hour emission rate for the year 1978. This bar shows the average of those two values. This bar shows the maximum 3-hour emission rate using CEM data for the year 2000. This bar shows the maximum CEM 3-hour emission rate for the year 2001. And, again, this bar shows the average of those two years.

Well, if you look, you can see using an apples to apples comparison, the maximum 3-hour

Page 475

emission rate in the baseline years is just equal to or slightly above the maximum 3-hour emission rate using CEM data for the years 2000-2001.

Similarly, if you go to Unit 1 and you check the 24-hour emission rate, you see in this bar the emission rate for the years 1977-1978, and, again, this bar shows the average for the CEM data for the years 2000-2001, and, once again, apples to apples comparison, the emission rates for 1977-1978 are greater or equal to those of the year 2000-2001.

If you do the same analysis on Unit 2, you find the same story. The maximum 3-hour emission rate for the years 1978-1979 is shown by this bar, which is higher than the average maximum 3-hour emission rate for the years 2000-2001 shown by this bar.

Similarly, if you go to the 24-hour maximum emission rate, and you can see that the average for the years 1978-1979 for Unit 2 is higher than the average using CEM data for the years 2000-2001.

From this analysis we can conclude then that the Leland Olds Station currently does not consume any increment.

Page 476

Now, the question was posed whether the application of the proposed CEM equivalent calculation to calculate baseline emissions might be flawed if sodium values are different in the baseline years than the current years, and the answer is sodium values in those time frames have remained within a narrow range.

Now, according to AP-42, a single equation can be used to calculate emission rates if you don't have any measured data for sodium values between 8 percent shown by this line and 2 percent as shown by this line. Now, if we place Unit 1 data in this graph, for the years 1975 through 1980 where this scale shows the time frames from 1975 through 1980 and the purple line shows the data for 1975 through 1980, and if you then put on the data for the years 1995 through 2001 as shown by the brown line, you can see that they all fall within a fairly narrow range and they all fall within this 2 percent and 8 percent range.

Similarly, if you go to Unit 2, as you can see, the purple line for the years 1975 through 1980 show the sodium values for Unit 2 during those years, and then the sodium values for the years 1995 to 2001 are shown by this brown line, and,

Page 477

once again, they all fall within a fairly narrow range and they all fall within the 2 percent and 8 percent range as described according to AP-42. Therefore, the sodium values should not affect the use of proposed CEM equivalent calculations.

That finishes my presentation. I would be happy to answer any questions.

MR. SCHWINDT: Mr. Melland, I had one question. The coal sample taken for sulfur that you referenced in your slide presentation, was that analysis taken of the coal going into the boiler or as it was going to the stockpile?

MR. MELLAND: That coal sample was taken during those years for the coal going to the stockpile. From there it was taken directly into the boiler.

MR. SCHWINDT: So it would reflect the coal that was being burned that particular day?

MR. MELLAND: It's the most representative. When it goes out of the stockpile, it goes out in the cone, and from below the cone are the feeders which feed the coal then directly to the boiler. That is one of the reasons we use just that day's coal supply, because if you go beyond that where you don't have the coal data, you

Page 478

don't know what you have, so the most representative would best -- we felt that day's coal burn would be most representative by that day's coal delivery.

MR. SCHWINDT: So how many days worth of coal do you have in the stockpile?

MR. MELLAND: Maybe I need to explain how the stockpile works.

MR. SCHWINDT: Okay.

MR. MELLAND: The coal comes out of the stockpile and goes into two cones. Below the two cones are the feeders that take the coal from those two cones -- delivery cones into the plant. If you have an excess, you can take that coal off the cone and bring it out to the stockpile. Normally the coal that is brought into the plant does not come from the stockpile unless you do not have enough coal on the cone. So the coal that goes onto that cone is the coal that's fed into the boiler. Are there any other questions?

MR. WITHAM: Lyle Witham, Attorney General's Office. Curt, I had a couple questions. I would like to start with your slide on the calculation used with the average monthly rate.

MR. MELLAND: Absolutely.

Page 479

MR. WITHAM: Can you tell me why you picked a month? What was your rationale for that?

MR. MELLAND: Go back and get it here. Yeah, there it is. Okay. Somehow you have to calculate the amount of coal that is burned during the 3-hour rate or the 24-hour rate. There are daily coal readings that are taken that tells you how much coal is burned in a particular day. That data is archived somewhere. So to be most expedient we can use -- we have monthly data, and that monthly data -- the reason we use heat rate is because the monthly data gives a snapshot of what the actual unit efficiency is during that month.

MR. WITHAM: Is a month the shortest period you have available?

MR. MELLAND: For the heat rate calculation, the month is the shortest date that we have available.

MR. WITHAM: Now, just for the clarification for both myself and the hearing officers, on the CEMs data you get an hour-by-hour emission rate?

MR. MELLAND: Right.

MR. WITHAM: Now, to do an apples to apples, what did you do?

Page 480

MR. MELLAND: We took the maximum 3-hour emission rate from CEMs data just as we did with the other data.

MR. WITHAM: Out of a month?

MR. MELLAND: For each month, that's correct. And then for each month -- once we did that for each month, then we took the maximums from those to determine the maximums for each year. So essentially what we did is we took the maximum 3-hour for the year, the CEM data, just as we did with the other data.

MR. WITHAM: And what you're saying then based upon that concept, that Leland Olds would be an increment expander rather than an increment consumer as under the Department's calculation?

MR. MELLAND: According to these calculations, this shows that during the baseline years of -- for Unit 2 and Unit 1 that we emitted as much or more SO2 during the 3-hour and 24-hour period than we currently do.

MR. WITHAM: Mr. Bachman put together the draft document in the docket on baseline emission rates. I'm going to let him ask a few questions. I do want to -- this was a point I made in some of the -- in some of the -- or the point the

Page 481

Department made in some of the legal documents. This is a review of the adequacy of the SIP and the drafts we put together are basically proposals. It isn't necessary for the hearing officer on a case-by-case, plant-by-plant basis to resolve, I think, each of these issues to determine the adequacy of the SIP. Some of these questions that we might be getting into in terms of the details may not be appropriate for these proceedings, but I think it would be appropriate for both the hearing officers and for us to understand some of the complexities by letting Tom and Curt discuss a couple of the points.

MR. BACHMAN: This is Tom Bachman of the Health Department. Just a couple quick questions. In the 1975 to 1980 period, you indicated that sulfur analyses were only done once to twice per month?

MR. MELLAND: They were done somewhere between two and four times a month.

MR. BACHMAN: How about sodium content?

MR. MELLAND: Sodium values, because it is so important to the operation of the boiler -- you know, sodium is one of those things in the coal that acts like glue in the ash. So when this

Page 482

sodium laying in the coal goes up in a convection pass, if there's a lot of it, there's a lot of glue, it causes a lot of ash accumulations, and that's very important to us when we're trying to run the boiler, so we measure sodium content for every coal sample that -- or coal delivery that we get so that we know what's coming.

MR. BACHMAN: So that would be once a day?

MR. MELLAND: That would be once a day.

MR. BACHMAN: So you could actually tie -- do you have the data to show for the date you picked the maximum 3-hour or the maximum 24-hour, you could tie that to sodium content?

MR. MELLAND: We certainly could do that.

MR. BACHMAN: Thanks. That's all I have.

MR. WITHAM: Curt, I don't know if this is within the scope of what you do at Basin, but would you -- I don't want a long story, but basically talk about the MAPP region that we're in and, well, some of the general things that go in terms of demand load that affect on an annual basis the amount of tons of coal that go through a facility in a year and whether that --

MR. MELLAND: Are you asking me to explain

Page 483

the demand in the MAPP region or the demand for load at Leland Olds?

MR. WITHAM: As affecting the total tons per year burned in the facility.

MR. MELLAND: Okay. I assume that you're asking how the demand for the power varied from the years 1975 to 1980 to the current years; is that what I'm hearing?

MR. WITHAM: Yeah, the general -- yeah.

MR. MELLAND: Well, I actually asked that question, went back to our marketing people and said, hey, can you tell me what -- show me what the demand was for power at Leland Olds Station from 1975 to 1980, and the answer I got back is we no longer have it. So in reality I really -- I can't give you a good explanation.

MR. WITHAM: All right. I have no further questions.

MR. SCHWINDT: Anybody else have any questions for Mr. Melland? Paul.

MR. GREEN: I hear about this sodium. In what form does that come in?

MR. MELLAND: The way we test it, Paul, is we test it for sodium oxide. That's the test that we use, and it's a measure -- and it gives us a

Page 484

measure of the amount of sodium. Now, if you're asking what other chemical forms that it's in, Paul, I really can't tell you.

MR. GREEN: But it comes as NA2 then?

MR MELLAND: NA2 is what we test for.

MR. GREEN: I keep hearing about acid rain. There's hydrochloric, boric acid, hydrochloric, we got normal hydrochloric in our tummies, as long as we got a good gas lining, no problem, hydrochloric, that's a different thing. Boric acid we put in our eye. I'm assuming what we're talking about here is sulfuric acid. Now, if we're talking about sulfuric acid, how do you make sulfuric acid? In a contact sulfuric acid plant you get your sulfur burner up to approximately three grams, you're circulating your sulfur and you get real --

MR. BAHR: Paul, Paul -- Paul, if you have a question, you need to ask the question. Okay? If you want to testify, that's at a different time.

MR. GREEN: Just give me a minute, will you?

UNIDENTIFIED PERSON: Easy, Paul.

MR. GREEN: Thank you. Now, if we've got all this SO2, where is the S2O3?

Page 485

MR. MELLAND: Paul, I can't address that. We don't have the measuring facilities at the plant to do that and I certainly can't -- I can't give you an answer.

MR. GREEN: What I was leading up to formerly when he broke in on me is that to get from sulfur to sulfuric acid, you've got to get to a S2O3 from your reactor, then you go to weak sulfuris acid, then you fatten it up with some SO2 and you get to H2SO4. Now, I would like a show of hands of people in this room that in three years started up 35 sulfuric acid plants. I know a little something about SO2. I heard so much from the State Health the first years I was in the Dakotas about NOX, and I was told that it was NO2 or N2O5, or so on, and I told some of the people in the State Health if you look in your inorganic chem handbook, you will see that NO2 is in an equilibrium with N2O5 and then right beside it in parentheses it says odorless, colorless. Now, for years they claimed that it was the NOX that was giving us the color, the odor. Now, we've come a long ways. We've admitted that it's SO2. We're on our way. Thank you for your time.

MR. SCHWINDT: Thank you. Any other

Page 486

questions? Thank you, Mr. Melland.

MR. CONNERY: With the hearing officers' permission, I would like to address some of the evidence that's been presented during the hearing. I tried in opening to address some of the questions which had come up before Basin testified. But in this closing I would like to address the evidence that has been presented.

And I would like to begin with one issue that has been addressed on several occasions, and that is what is the baseline, what is the baseline level using 1976 and 1977? It has been testified that the State used bubbler data and that data is not good enough to credit. If you look at the history, the PSD document that's been put together, it more closely comports with the levels that some of the experts testified they've used for regional background on the order of 25, those kinds of readings during that time. But because there's no data or credible data, the State has modeled backwards into those years. Mr. Long in his testimony suggested that the way the State should do this would be to look at the trend that was occurring. He suggested you might project that downward, if you'll recall that testimony.

Page 487

If we could go to my next slide. They were going to tape my two fingers together so I couldn't do it wrong here.

This is the data that was presented by Mr. Winges. It is the State's data from the monitors. And if you will notice, while it is in different units, it is the same data that follows the same terms. EPA was in parts per million. This graph is in micrograms per cubic meter.

These two dots that Mr. Long suggested be projected downward, if EPA had included, and I do not know why they did not include, the '79 data, actually show that the second highest, highest second high for 1979 was higher. I would simply suggest to you that in addition to modeling which the State has used to project that backward, that you consider using standard statistical methods to project the data back. The additional -- it's only about 13 months, less than that actually, that you would need to -- into December 17th, 1977. As far as I know, and the State knows better than I, whether or not there was a significant change during that period of time. If there's no reason to expect that there was a significant change, then I think projection backward using standard

Page 488

statistical methods is probably as valid as modeling. Modeling has got a lot of problems. As you know, there's much less deviation in source data and in monitoring data.

The second point that I would like to make has to do with a separate ground, a significant one, that affects whether or not the State plan is adequate, and what the State should take into account and weigh in making that determination. We've talked about ambient data, we've talked about modeling, and I'll talk a little bit more about those, but I wanted to go into the determinations by the Federal Land Managers who run the North Dakota Class I areas on what the impact on air quality has been in their parks. It's been made, as I alluded to several times, from 1982 to the latest time in 1993. That determination was a very, very intense determination. For instance, with respect to visibility it was a level 3 determination. That is the most intense highest level of visibility review for a Class I area under EPA's methodology at that time. They did make determinations on visibility, and I would suggest to you that they are as well founded or better founded than any suggestion on that subject today

Page 489

that could be made or was made.
What they determined was that the proposed increase in allowable emissions should not increase perceptible plume impacts, what's called plume blight, or contribute to regional haze impacts. There was some suggestions about that subject in the testimony on Monday. Findings have been made on that subject and, as was pointed out, the emissions since that time, since 1993, have decreased overall in the state by a total of 40,000 tons a year of SO2 for all sources.
Now, I think that that is a good basis for determining what I think is the most important and determinative factor about air quality in Class I areas, which is whether the air quality is being adversely affected. As you know, I do not think that Class I increment is an absolute and I think much more basic is the AQRV. I believe that is consistent with the congressional intention.
The Federal Land Manager made many other findings. You've seen some of them, are familiar with them. The biological resources would not be adversely affected due to air pollution at North Dakota Class I areas. Mr. Winges covered number 4. There were findings.

Page 490

This is the specific finding that I alluded to that was made by the Federal Land Managers in number 5 here, that the alternative increment would not be exceeded. That is the applicable increment when you're dealing with a source that exceeds the Class I increment. And he made a specific determination that it didn't exceed that. There's no question about it. It's not even in controversy here.
There were also very broad findings that dealt with whether or not the total emissions, the 12.7 micrograms per cubic meter that Mr. O'Clair testified to, would impair visitor experience, whether it would diminish the national significance of the park or wilderness area, whether it would cause or contribute to the impairment of the structure and functioning of ecosystems. This has to do with prevention of significant deterioration more specifically, more directly, more to the root things that the public is concerned about than modeling and an arbitrary number, which is what the Class I increment is.
I'm not going to take your time with the rest of that. I think you can turn that off, Ompie.

Page 491

Finally, I would simply like to touch on a couple of the things that have been raised here. In determining whether or not the State plan is adequate as the State has proposed to prevent significant deterioration, we have presented evidence dealing with three aspects: Monitored data, air quality related values, and modeling.
You heard Mr. Winges testify that the monitoring data you have collected is good data, as good as he's seen. He's looked at your monitoring sites. It's included in EPA's AIRS database, it's the gold standard. And what it shows -- Ompie, if you could turn that on again, I would like to back up to a couple slides.
What it shows, I'm making some assumptions here, if you look at the monitoring data, that trend line that I put up for 24-hour values, the second high, second highest high, as I said, we don't really know where the baseline is as of December 17, 1977. We know what the data trend line looks like starting 13 months, about a year later, 11 months later.
What it shows is that somewhere -- we don't know whether if you took Mr. Long's suggestion and went down here to 25 maybe, or 40,

Page 492

exactly where it is, but we know it's somewhere in there. We know it's not down here. I think we know that. But the increment, of course, is that additional 5 micrograms we're talking about. We know that whatever it is, this is Teddy Roosevelt North Unit, that the monitored data shows that the increment has expanded and expanded significantly by two or three times at worst the level that is allowed as a matter of increase, so that if you use this data and simply look at -- don't look at air quality related values, don't look at any of the things that have been suggested to you other than the monitored data, it shows increment expansion; or if you're at the South Unit, it shows no use of that increment, that it's still available on the same basis.
As I mentioned at the beginning, I think monitored data, as you've heard from Mr. Winges, when it's used in contrast to modeling, it is the standard by which modeling is judged. If the modeling conforms better to the ambient data, it's better modeling. So that, of course, is what we tried to provide, was useful modeling that did come closer to the monitored data.
Now, comparing the two, we think the

Page 493

monitoring is the better data, and we think that this is a very sound basis for the State to judge whether or not it's done a good job. To get to the modeling, you heard about -- Mr. Winges tell you that for this purpose -- not for new source review, but for this purpose it can't do the job that EPA says it must do. It can't do that period of time and space, it can't get to the result. Simply because of the differences in bottling all of those sources, it can't do that job. We know it's being used. We know it's being used to judge your work. And so I want to just talk briefly about the EPA modeling. It was put forward in this hearing as the basis for requiring the State to revise its state implementation plan and for determining that the state plan is inadequate to prevent significant deterioration and protect the increment.

When you look at EPA's modeling and whether it could sustain that conclusion or serve as a basis for that determination, I think there are a number of things to consider. One is that EPA doesn't even pretend to know what emissions are representative of normal operations in North Dakota. It just assumed it. It just said 1976 to '77. It did not do what the State has done. The

Page 494

State has, if you've read their document, made a detailed determination of what two years are representative for each source based on a close review of heat input, sulfur levels, you know, the technical details of that. It is a better basis. EPA is not entitled to simply assume what's representative operations. That's the kinds of things that the State knows and that EPA does not know, and that's why it's primarily in your hands, and I would argue ultimately in your hands.

EPA testified that the most significant source affecting the Class I areas on a modeled basis is oil and gas sources. EPA did not model oil and gas sources. EPA probably cannot model oil and gas sources unless you tell them how to do it. The data for that and the knowledge of it and making reasonable judgments about it is something that I think really only the State can do, and should do primarily, and if done on a reasonable basis would be accepted. And, as you know, those emissions have declined from a level of around 35,000 tons a year in the early '80s to less than 5,000 now.

So on those two factors alone I think the EPA data is sadly -- the EPA modeling is sadly

Page 495

lacking, far from the superior basis for overruling state action. The EPA, of course, also does not know, and I think critically does not know, or care, what the baseline emissions are. It has said that over and over again. And if you don't know what the baseline emissions are, how can you know what the increment is? And if you're assessing Class I increment where air quality related values are the touchstone, not the Class I increment, how can you possibly disregard the baseline? The State takes the baseline into account in its methodology. EPA doesn't have a methodology for doing this. It's got a new source review methodology. It doesn't have rules, regulations or any structure for doing this. The suggestion that it somehow does and can tell you what that is and how to do it, as you know, I find to be without substantiation.

The last thing I would say is that this is not a guideline model they've used. It's not permitted to be used by EPA under their own rules. Their rules say you have to use a guideline model. If you don't, you have to have a notice and an opportunity for hearing on it. They haven't noticed this model. They haven't given an

Page 496

opportunity for its hearing. So I think the suggestion that the EPA modeling is better in some fashion simply isn't supported by their evidence in this case.

The State's modeling, on the other hand -- and EPA's, I should mention, as well, they left out sources -- significant sources, the Mandan Refinery. At the same time the State's inventory contained many adjustments that did reflect increment expansion and has a superior database, as Mr. Hammer testified. He also testified that a better basis would be to include and use in your emission inventory an apples to apples comparison of emissions and that there's a better way to do that which we hope is a useful suggestion.

Finally, Mr. Paine was asked to suggest the best data and the best way of running the Calpuff model, a matter which you may gather he knows something about. What he used, I think, was a far superior database. To really do -- have any chance of knowing what's happening at the level that these emissions are injected into the atmosphere, stack height plus plume rise which is in the upper air, you have to know what that wind field is between the plant and the Class I area.